

## CLAIMS:

1. A monitoring system for dark-field imaging of a target area below a surface of an object, the monitoring system including
- an illumination optical system (31) to emit an illumination beam along an illumination beam path onto the object and
  - 5 - an imaging system (35) to receive a returning imaging beam from the target area along an imaging beam path, wherein
  - the imaging system includes a selective optical interception system (32,37,51,52) to intercept a returning illumination beam from the region between the surface and the target area.
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2. A monitoring system as claimed in Claim 1, wherein
- the illumination system is arranged to produce the illumination beam as a polarised illumination beam and
  - the selective optical interception system includes a polarisation-analyser having its
  - 15 axis crossed relative to the polarisation axis of the polarised illumination beam.
3. A monitoring system as claimed in Claim 1, wherein the selective optical interception system includes an aperture stop that essentially intercepts a central portion of the returning imaging beam.
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4. A monitoring system for dark-field imaging of a target area below a surface of an object, the monitoring system including
- an illumination optical system to emit an illumination beam along an illumination beam path onto the object and
  - 25 - an imaging system to receive a returning imaging beam from the target area along an imaging beam path, wherein
  - the illumination optical system produces an unfocussed illumination beam.

5. A monitoring system for dark-field imaging of a target area below a surface of an object, the monitoring system including
- an illumination optical system to emit an illumination beam along an illumination beam path onto the object and
  - 5 - an imaging system to receive a returning imaging beam from the target area along an imaging beam path, wherein
    - the illumination beam path and the imaging beam path subtend an angle and
    - the illumination optical system has an illumination focus,
    - the imaging system has an imaging focus and
    - 10 - the illumination focus being displaced from the imaging focus.
6. An analysis apparatus comprising
- a spectroscopy system that includes
    - an excitation system (1) to emit an excitation beam to a target area below a
    - 15 surface of an object and
  - the analysis apparatus further comprising a monitoring system (31,35) to image the target area, the monitoring system including
    - a illumination optical system (31) to emit an illumination beam along an illumination beam path onto the object and
    - 20 - an imaging system (35) to receive a returning imaging beam from the target area along an imaging beam path, wherein
    - the illumination beam path and the imaging beam path subtend an angle.
7. An analysis apparatus comprising a spectroscopy system that includes
- 25 - an excitation system to emit an excitation beam to a target area below a surface of an object and
  - the analysis apparatus further comprising a monitoring system as claimed in any one of Claims 1 to 5.